Exercise for the Visually Impaired
Jacqueline holds the Canadian record for the 200m sprint (T12 class).

Earned two gold (100m and 200m) and one silver medal (400m) at the 2011 Canadian Track & Field Championships in Calgary.

Varsity team member with the Western Mustang Athletics

Goals for both the Para Pan-American Games and 2012 London Paralympic Games is to narrow the gap in world rankings from top ten to Podium.
Visual Impairment Overview

- **Definition:** vision loss that causes significant limitation of visual capability

- **Best corrected vision of less than 20/60**

- **Vision can’t be corrected by refractive correction or medication**

- **Causes?**
  - Disease
  - Trauma
  - Degenerative conditions
### Anatomy of the Eye

![Eye Diagram](image)

**Table 6.1 Anatomical Site of Visual Impairment (n=333)**

<table>
<thead>
<tr>
<th>Site of Visual Field Impairment</th>
<th>Percentage of Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whole Globe</td>
<td>22%</td>
</tr>
<tr>
<td>Cornea</td>
<td>1%</td>
</tr>
<tr>
<td>Lens</td>
<td>3%</td>
</tr>
<tr>
<td>Uvea</td>
<td>4%</td>
</tr>
<tr>
<td>Retina</td>
<td>17%</td>
</tr>
<tr>
<td>Optic Nerve</td>
<td>6%</td>
</tr>
<tr>
<td>Brain</td>
<td>47%</td>
</tr>
</tbody>
</table>
Different Types of Visual Impairment
Different Types of Visual Impairment

- Visually impaired clients can range between 3 classifications
  - very unclear vision
  - ability to detect motion or presence of light
  - total blindness

- Partially sighted – type of visual impairment with a need of special education

- Low vision – severe visual impairment
  - Myopic – near/short sighted
  - Hyperopic – far/long sighted

- Legally blind – less than 20/20 vision

- Totally blind – no vision
Precautions During Exercise
Most common physical problems

- Balance
- Posture
- Coordination
- Tense neck and shoulder muscles
- Loss of spinal rotation and reciprocal arm swing
Benefits of Exercise

- Remember – individuals are visually impaired and their bodies work as well as sighted individuals

- 5-6 week physical training session was successful in improving physical condition, mental state and/or balance

- Benefit from exercise in the same ways as sighted individuals
  - Better overall health
  - Improved cardiovascular fitness
  - Improved muscular endurance
  - Increased social interaction
  - Increased physical coordination
Contradictions

- lack of sight
  - Recall: either complete lack of vision or ability to detect light and colours

- lack of spatial awareness

- depending on time of diagnosis, may or may not have any experience with exercise

- lack of confidence
Contradictions

- reason for blindness
  - injury?
  - concussion?
  - car accident
  - inherited?
  - Disease?
- less common
  - visually impaired exhibited lower levels of fitness than peers
- lack of knowledge and awareness
United States Association of Blind Athletes

- USABA Sports Education Camp

- Colorado-based organization that provides sports opportunities for individuals with visual impairment

- Allow people who are blind and visually impaired develop independence through competition

- Mission: to change society’s negative stereotypes concerning the abilities of the visually impaired
United States Association of Blind Athletes – Paralympic Games

- Events for visually impaired individuals in the Paralympic Games
  - Biathlon
  - Judo
  - Track & field
  - Swimming
  - Powerlifting
  - Showdown
  - Goalball
  - Alpine & Nordic skiing
  - Ten pin bowling
  - Archery
  - Equestrian
  - Rowing
  - Sailing
Paralympic equestrian

The only equestrian event in the Paralympics is dressage, where riders control the horse’s movements in a series of manoeuvres. In the freestyle event, this is done in time to music.

The arena

In gait trot or canter the rider and horse must perform figure tests on a course marked out with letters.

Special rules

Scores and adaptations are allowed for some disability classes to ensure a level playing field.

Reins can be held by mouth or strapped to torso.

Backwards movement

To make the horse walk backwards. A common move is to make the horse retreat with its legs diagonally paired, the legs being raised and set down at the exact same moment.
Paralympic goalball
Played by visually impaired athletes using a ball with bells inside, it is among the most exciting team sports on the Paralympic programme

The aim
To score by rolling the ball at speed into the opposition’s goal, the opposition attempts to block the ball with their bodies

9m Width
4 goal judges
2 referees
1.3m tall goal across the width of the court

18m Length

Shades worn by all players

Under-arm throws at goal up to 60mph

Bells inside the ball for acoustic orientation

Padding - Players well padded for diving saves
Games for the Visually Impaired

- Visually impaired individuals can perform in many common activities with slight modifications

- Gymnastics
  - Floor competitors – count steps to edge of mat
  - Use different textured mats
  - Balance beam – warn when individual is near the edge

- Basketball
  - Place metronome behind the backboard
  - Use bounce passes
  - Award point for hitting the rim
Training

- Cardiovascular and muscular based training extremely important.

- Shouldn’t have to give up cardiovascular activities such as running, cycling, or swimming.

- O.F.I.T.T. – same for sighted and visually impaired individuals because bodies are still fully functional.
Running Techniques

http://www.youtube.com/watch?v=nfSa5ZFrnkI
Sighted Guide

- runner places thumb laterally on guide’s elbow
- guide holds the shoulder
- hold hands
- (if low vision): guide can wear a bright shirt
- guide needs to be able to run faster than runner as to not hold the athlete back
- the running gait can be efficient with almost full arm swing with both arms
Tether

- short rope, band or anything that can be used to attach the wrists of both the guide and the runner
- very common in Ireland
- more independent for the runner than other techniques
- they feel they have more space and freedom
Caller

- not restricted by holding onto anything
- can run at any speed without the worry of being beside another person
- caller stands at the end of the gymnasium calling out instructions
- caller can run beside or behind to runner with bells, keys and or verbal instructions
- arm motion completely full and natural
Treadmill Running

- common and accessible
- use a treadmill with handrails
- start of slow using handrails
- progress to full arm swing without using handrails, letting them act as a guide
Biking Techniques
Stationary Bike

- weather independent
- guide independent
- can ride stationary bike at home or in a gym
- improved aerobic endurance, muscular strength and muscular endurance
Tandem Bikes

- sighted participant rides in front
- responsible for steering and pedaling
- blind person rides in the back
- responsible for pedaling
- signals should be decided on before hand as to when to initiate turns and stops
- effective communication is necessary
- **LAPS** - issue of turning and swimming in proper lane direction

- friend or instructor can use a noodle and a kickboard to tap the swimmer’s shoulder or back when they are 3-4ft from the wall

- beginners should use flotation devices

- treading water is great for swimmer’s who are less comfortable with the pool surroundings but still want a water aerobic based work out
Exercise Techniques in a Fitness Facility
1. **Allowing time for exploration**
   - When introducing individuals to a machine allow them time for tactile or visual exploration.

2. **Demonstrating** - the instructor should demonstrate the movement and identify the exercise and the muscles involved
   - The instructor may ask participants to repeat some of the skills to ensure understanding and safe performance.

3. **Offering the option to perform.** Encourage individuals to try everything, but let them understand that declining to perform is an option.
3. **Provide detailed verbal instructions**

4. **Numbering the stations**

- Label each piece of equipment with a designated number
- Large print, hi-mark paint, or Braille.
- Rope, tape, or tactile guide
5. Point out electronic switches - safety (on and off switches)

6. Participants can keep track of time on machines with ringing or vibrating timers worn around their necks or in their pockets.
General Guidelines

- Choose environments that are comfortable and familiar
- Avoid situations that increase anxiety related to physical activity
- Do activities that don’t differ significantly from sighted activities and don’t largely depend on visual input and feedback
- Activities should encourage spatial movement and build mobility
- Develop active lifestyle habits early in life before a low self-confidence manifests
Possible Questions

- What are 3 exercise techniques visually impaired individuals can use in a fitness facility?

- What strategies can be used for visually impaired individuals who want to be runners?

- Can visually impaired individuals bike? How?

- What are the different levels of visual impairment and how does this affect exercise limitations?

- How is the O.F.I.T.T model altered for visually impaired individuals compared to sighted individuals?